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Notes ID: 62BDCEA3BC3A9C7D852579AB0056C89E

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Delivered Date: 02/21/2012 11:17 AM EST

Subject: Re: The Hague conference: clean cookstove standards (solar thermal cookers)

Pat,

Thank you so much for your thoughtful email. We appreciate the time you took and the detailed comments you provided. We are trying to provide an opportunity for as many Partners who want to provide comments on the IWA proposal through a comment section on the PCIA website at

<http://www.pciaonline.org/content/iwa-discussion-questions> Regarding any inaccuracies in the protocol report, please forward them to Nathan Johnson who was the principal author of the report.

As mentioned in the IWA proposal and presented and then discussed on the three webinars we held to present the IWA, we do plan to initially utilize the safety protocol developed by Iowa State University to test stoves for safety. And, as with protocols for other performance measures, we will be seeking to improve existing protocols, and develop new protocols to ensure that each stove type is tested by the most appropriate protocol to best determine its performance. With safety, as with the other performance indicators, when stoves are tested, the regional testing center will communicate with the stove builder or disseminator to gain an understanding of how the stove is meant to be operated to ensure that it is tested as it is intended to be operated.

Finally, in neither the standards and testing working group, nor the standards development group, were there participants representing a particular type of cooking stove or fuel. These were stove and fuel neutral activities (as I believe the recommendations reflect), led by researchers and leaders in the stove testing field with the goal of moving our community - our entire community - forward.

Thanks again for your comments,

John

John Mitchell

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▼ Patricia Mcardle ---02/20/2012 01:32:29 PM---Dear Brenda and John, The section of The Hague International ISO workshop draft resolution that deal

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Date: 02/20/2012 01:32 PM

Subject: The Hague conference: clean cookstove standards (solar thermal cookers)

Dear Brenda and John,

The section of The Hague International ISO workshop [draft resolution](#) that deals with evaluating the safety of cooking devices, cites as its reference the [Iowa State Safety protocols](#) developed by a doctoral student of Prof. Mark Bryden. There are a number of inaccuracies in this document regarding solar cookers which I would like to flag for your information (my comments are in red). Since no solar cooking experts were invited to serve on the standards and testing working group or were involved in the development of the draft ISO workshop agreement, I thought it would be useful for you to have this information prior to the upcoming meeting in The Hague. As a member of the GACC's fuels and technology working group and as a long-time supporter of PCIA's efforts, I hope this information will be useful to you and your technical staff.

Figure 10.(above) on p. 18, Solar 2.3.3, **shows a handmade parabolic solar cooker with an enclosed cooking box at the focal point. [Manufactured parabolic solar cookers](#) do not use enclosed cooking boxes like the one shown. They have pot holders, where ordinary cooking vessels, pressure cookers, frying pans or tea kettles can be heated just as they would be over a wood or gas fire. There are hundreds of thousands of [mass-produced parabolic solar cookers](#) being used in China, India and elsewhere that are far safer, more portable, less expensive and more efficient than the model shown in this photo.**

3.2.3 Solar Stove Use:

"Solar cookers are most effective during times of the day when the sun is near its peak."

Depending upon the latitude and time of year, solar box and panel cookers can be used effectively from as early as 9 am until as late as 5 pm. Solar parabolic cookers work [regardless of ambient temperature] as soon as they have a direct line of sight to the sun--virtually from sunup to sundown.

"Solar stoves are therefore used mostly in "sunny" regions of the world near the equator." This is not correct. Although equatorial regions are certainly ideal locations for using solar cookers, China, which is located between 19 and 50 degrees north of the equator, has more solar cookers in use than any other country in the world. Solar parabolic cookers are used in the Himalayas as well as in the high steppes of western China/Tibet/Afghanistan and Kashmir. When thousands of people in the DC area (38 degrees north) lost power during the big snowstorms of 2010, both [Jose Andres](#) and [I cooked food and heated water](#) in our backyards between snowstorms with our parabolic solar cookers.

"Cooking occurs by placing food into a closed container."

Although box and panel solar cookers do work by putting the cooking pot inside a closed container, parabolic solar cookers (as I noted above) do not require a closed container.

"Other burns may occur by touching the reflective surfaces on a solar stove. Burns incurred from coming into contact with the reflectors is related to the type material (metal, Mylar, mirror) and its capacity to conduct heat."

This is not correct. The reflectors on solar parabolic, box and panel cookers do not have direct contact with the cooking surfaces nor do they conduct heat from the cooking pot. They remain at the ambient temperature of the outside air throughout the cooking process and are safe to touch at all times.

"Burns may also occur from solar stoves if hands are placed too close to the focal point."

The reflectors on box and panel solar cookers do not create a 'focal point' since they reflect light evenly all around the cooking vessel. Parabolic solar cookers do have a focal point, but in order for someone to receive a burn as described in the quote above, they would have to hold their hand for several seconds inside (rather than 'too close to') the narrow (two to three inch) focal point--a highly unlikely occurrence. I am unaware of any

documented cases of people sustaining burns by putting their hands into the focal point of a parabolic solar cooker.

5.3.6 Test Six: Heat Transmission to Surroundings

"Large amounts of heat transmission to surroundings may ignite combustibles or construction in the area of the cookstove. Therefore cookstoves should not cause elevated temperatures on surrounding surfaces in the environment (ANSI 1993, ANSI 2000, UL 1995). **An exception with this test arises with solar stoves.** They can direct large amounts of heat onto surrounding materials **without showing much result until catastrophe**. Therefore array collectors with open mirror configurations similar to those shown in Figure 10 [see above photo] of Section 2.3.3 **automatically receive a rating of Poor**."

"Solar cookers that are more enclosed ([Figure 9](#)) and have a better limit on where sun rays are directed **receive a rating of Fair**."

The enclosed cooking chambers and pots of solar box and panel cookers reach temperatures between 250 and 350 degrees fahrenheit. Since combustion temperature is 451 fahrenheit, these two types of solar cookers are incapable of starting a fire.

"This [solar cooker] test has been simplified in this manner **due to the great complexities associated with measuring radiative heat**."

When I met with Jim at his lab in North Carolina, he already had a copy of the standardized solar cooker test protocols that were developed in 2003 by the American Society of Agricultural Engineers.

"Ratings were chosen with knowledge that **solar stoves can produce fires without warning** (personal communication, Norida MacCarty, January 30, 2005)."

I am not aware of any documented reports regarding accidental fires started without warning by a solar parabolic cooker. Giving parabolic solar cookers a 'poor' safety rating and panel and box solar cookers a 'fair' safety rating based solely on a 'personal communication' from Norida MacCarty, lacks statistical and scientific validity. ##

I saw in [Radha's latest GACC report](#) that while she was in India, she met with the Minister of New and Renewable Energy. I just returned from a [Scheffler Solar Cooker workshop](#) in Dhule, India, sponsored by that ministry and by the College of Engineering in Dhule. I know that the Shell Foundation has funded a great deal of research on fuel efficient stoves in India, but I am unaware of the MNRE sponsoring any biomass fuel efficient stove projects since their focus is on solar, wind and biogas energy. Is there any way to learn more about Radha's discussion with the minister? Did they talk about solar cooking since India is second only to China in the use of solar cookers by its population? We learned during our workshop that the ministry is providing subsidies for the purchase of solar cookers and that they have sponsored a number of pilot projects around the country. [attachment

"Unknown.jpeg" deleted by John Mitchell/DC/USEPA/US]

The salt pan workers visited by Radha in Surendranagar District, Gujarat State would seem to be ideal candidates for using solar parabolic cookers as their primary method of cooking and heating water during the day, with fuel-efficient stoves or biogas makers as a back-up, and [retained heat cookers](#) to simmer food and keep it hot until after dark.

All the best,

Pat

[Patricia McArdle](#)

Arlington, Va.

Member, Board of Directors

Solar Cookers International

YouTube channel [solarwindmama](#)

<http://www.patriciamcardle.com/index.html>

Read an excerpt from my

novel [Farishita](#), inspired by the year I spent in Afghanistan.

"Qatra, qatra darya mesha."

Drop by drop it becomes a river.

--Afghan Proverb

